

What is claimed is:

1. (cancelled)
2. (cancelled)
3. (cancelled)
4. (cancelled)

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5. A liquid crystal display device comprising: a first substrate made of a transparent material, provided with signal electrodes or display electrodes formed on one face thereof; a second substrate made of a transparent material, provided with opposed electrodes formed thereon; and liquid crystal sealed in-between the first substrate and the second substrate, oppositely disposed to each other with a predetermined gap interposed therebetween such that each of the signal electrodes or the display electrodes faces each of the opposed electrodes so as to form a pixel, characterized in that

a polarizing film is disposed on the visible side of the first substrate,

a white diffusing film, a polarizing film, and a reflector are disposed in that order on the outer side of the second substrate;

said white diffusing film has the characteristics of allowing circularly polarized light to pass therethrough substantially as the circularly polarized light, and having a substantially equal transmittance for light components at respective wavelengths in the wavelength range of visible light.

6. A liquid crystal display device according to claim 5, wherein the reflector is a transflective reflector, and has the characteristics of having a substantially equal transmittance for light components at respective wavelengths in the wavelength range of visible light.

7. A liquid crystal display device according to claim 5, wherein another white diffusing film is disposed between the first substrate and the

polarizing film.

8. (cancelled)

9. (cancelled)

del 82 10. (amended) A liquid crystal display device comprising: a first
5 substrate made of a transparent material, provided with signal electrodes or
display electrodes formed on one surface thereof; a second substrate made of a
transparent material, provided with opposed electrodes formed thereon; and
liquid crystal sealed in-between the first substrate and the second substrate,
oppositely disposed to each other with a predetermined gap interposed
10 therebetween such that each of the signal electrodes or the display electrodes
faces each of the opposed electrodes so as to form a pixel, characterized in that

a white diffusing film and a reflector are disposed in that order from the
first substrate side on the second substrate;

said white diffusing film has the characteristics of allowing circularly
15 polarized light to pass therethrough substantially as the circularly polarized light,
and having a substantially equal transmittance for light components at respective
wavelengths in the wavelength range of visible light, and said reflector being
made up of a reflection-type polarizing film, wherein one of the optic axes
thereof is the transmission axis and the other, substantially orthogonal to the
20 transmission axis, is the reflection axis.

11. (amended) A liquid crystal display device comprising: a first
substrate made of a transparent material, provided with signal electrodes or
display electrodes formed on one face thereof; a second substrate made of a
transparent material, provided with opposed electrodes formed thereon; and
25 liquid crystal sealed in-between the first substrate and the second substrate,
oppositely disposed to each other with a predetermined gap interposed

therebetween such that each of the signal electrodes or the display electrodes faces each of the opposed electrodes so as to form a pixel, characterized in that

a polarizing film and a white diffusing film are disposed in that order from the visible side on top of the first substrate, and

5 a reflector is provided on top of the second substrate;

said white diffusing film has the characteristics of allowing circularly polarized light to pass therethrough substantially as the circularly polarized light, and having a substantially equal transmittance for light components at respective wavelengths in the wavelength range of visible light, and said reflector being made up of a reflection-type polarizing film, wherein one of the optic axes thereof is the transmission axis and the other, substantially orthogonal to the transmission axis, is the reflection axis.

12. A liquid crystal display device according to claim 5, wherein the reflector is made up of a reflection-type polarizing film, wherein one of the optic axes thereof is the transmission axis and the other, substantially orthogonal to the transmission axis, is the reflection axis.

Sub B3 13. (amended) A liquid crystal display device comprising: a first substrate made of a transparent material, provided with signal electrodes or display electrodes formed on one face thereof; a second substrate made of a transparent material, provided with opposed electrodes formed thereon; and liquid crystal sealed in-between the first substrate and the second substrate, oppositely disposed to each other with a predetermined gap interposed therebetween such that each of the signal electrodes or the display electrodes faces each of the opposed electrodes so as to form a pixel, characterized in that

25 a polarizing film is disposed on the visible side of the first substrate while a polarizing film, a white diffusing film, and a reflector are

disposed in that order on the outer side of the second substrate;

said white diffusing film has the characteristics of allowing circularly polarized light to pass therethrough substantially as the circularly polarized light, and having a substantially equal transmittance for light components at respective wavelengths in the wavelength range of visible light, and said reflector being made up of a reflection-type polarizing film, wherein one of the optic axes thereof is the transmission axis and the other, substantially orthogonal to the transmission axis, is the reflection axis.

14. (amended) A liquid crystal display device according to claim 10, wherein the reflector is made up of a laminate of reflection-type polarizing films wherein one of the optic axes thereof is the transmission axis and the other, substantially orthogonal to the transmission axis, is the reflection axis.

15. (amended) A liquid crystal display device comprising: a first substrate made of a transparent material, provided with signal electrodes or display electrodes, formed on one face thereof; a second substrate made of a transparent material, provided with opposed electrodes formed thereon; and liquid crystal sealed in-between the first substrate and the second substrate, oppositely disposed to each other with a predetermined gap interposed therebetween such that each of the signal electrodes or the display electrodes faces each of the opposed electrodes so as to form a pixel, characterized in that

a polarizing film is disposed on the visible side of the first substrate,

a polarizing film, a white diffusing film, and a reflector are disposed in that order on the outer face of the second substrate;

said white diffusing film has the characteristics of allowing circularly polarized light to pass therethrough substantially as the circularly polarized light, and having a substantially equal transmittance for light components at respective

wavelengths in the wavelength range of visible light, and said reflector being made up of a holographic film in which regions having different refractive indices are spatially distributed.

16. (cancelled)

5 ~~22~~ ~~35~~ 17. A liquid crystal display device comprising: a first substrate made of a transparent material, provided with signal electrodes or display electrodes formed on one face thereof; a second substrate made of a transparent material, provided with opposed electrodes formed thereon; and liquid crystal sealed in-between the first substrate and the second substrate, oppositely disposed to each other with a predetermined gap interposed therebetween such that each of the signal electrodes or the display electrodes faces each of the opposed electrodes so as to form a pixel, characterized in that

10 a color printed layer and a white diffusing film are disposed in an optional order on the second substrate while a reflector is disposed on a side of the color printed layer or the white diffusing film, opposite the visible side,

15 said white diffusing film and said color printed layer has the characteristics of allowing circularly polarized light to pass therethrough substantially as the circularly polarized light, respectively, said white diffusing film having the characteristics of having a substantially equal transmittance for
20 light components at respective wavelengths in the wavelength range of visible light, and further, said color printed layer has a transmittance having wavelength dependency.

18. (cancelled)

25 19. A liquid crystal display device comprising: a first substrate made of a transparent material, provided with signal electrodes or display electrodes formed on one face thereof; a second substrate made of a transparent material,

provided with opposed electrodes formed thereon; and liquid crystal sealed in-between the first substrate and the second substrate, oppositely disposed to each other with a predetermined gap interposed therebetween such that each of the signal electrodes or the display electrodes faces each of the opposed electrodes so as to form a pixel, characterized in that

a white diffusing film and a color printed layer are disposed in an optional order on the second substrate while a reflector and a light absorption layer are disposed in this order on a side of the white diffusing film or the color printed layer, opposite the visible side;

said reflector being a reflection-type polarizing film wherein one of the optic axes thereof is the transmission axis and the other, substantially orthogonal to the transmission axis, is the reflection axis; and

a reflectance of said color printed layer for light reflected towards the side of the second substrate side is smaller than that of said light absorption layer for light reflected towards the side of the second substrate.

20. A liquid crystal display device according to claim 19, wherein the color printed layer or the light absorption layer is composed of a plurality of portions, each having a transmittance having a wavelength characteristics in the wavelength range of visible light.

21. (amended) A liquid crystal display device according to claim 5, wherein the white diffusing film has a transmittance of 70% or more.

22. (amended) A liquid crystal display device according to claim 5, wherein the white diffusing film is made of a complex substance comprised of resin beads and a synthetic resin having a refractive index differing from that of the resin beads, and has a light-scattering characteristics due to the difference in refractive indices therebetween.

23. (cancelled)

24. A liquid crystal display device according to claim 5, wherein the white diffusing film is made of a complex substance comprised of resin beads and a synthetic resin having a refractive index differing from that of the resin beads, and has a light-scattering characteristics due to the difference in refractive indices therebetween.

25. (cancelled)

26. A liquid crystal display device according to claim 17, wherein the white diffusing film is made of a complex substance comprised of resin beads and a synthetic resin having a refractive index differing from that of the resin beads, and has a light-scattering characteristics due to the difference in refractive indices therebetween.

27. (cancelled)

28. A liquid crystal display device according to claim 19, wherein the white diffusing film is made of a complex substance comprised of resin beads and a synthetic resin having a refractive index differing from that of the resin beads, and has a light-scattering characteristics due to the difference in refractive indices therebetween.

29. (Amended) A liquid crystal display device according to claim 5, wherein the white diffusing film is a white diffusing film with a plurality of projections and depressions formed on the surface thereof, causing a portion of light incident on the surface to undergo diffuse reflection and remaining portions of the light to be transmitted therethrough, said projections and depressions formed on the surface being in a shape approximating to a quadratic curve.

30. (amended) A liquid crystal display device comprising: a first substrate made of a transparent material, provided with signal electrodes or

display electrodes formed on one face thereof; a second substrate made of a transparent material, provided with opposed electrodes formed thereon; and liquid crystal sealed in-between the first substrate and the second substrate, oppositely disposed to each other with a predetermined gap interposed therebetween such that each of the signal electrodes or the display electrodes faces each of the opposed electrodes so as to form a pixel, characterized in that

a polarizing film is disposed on the visible side of the first substrate

a polarizing film, a white diffusing film, and a reflector are disposed in that order on the outer side of the second substrate;

said white diffusing film is a white diffusing film having the characteristics of allowing circularly polarized light to pass therethrough substantially as the circularly polarized light, and having a substantially equal transmittance for light components at respective wavelengths in the wavelength range of visible light, provided with a plurality of projections and depressions formed on the surface thereof, causing a portion of light incident on the surface to undergo diffuse reflection and remaining portions of the light to be transmitted therethrough, said projections and depressions formed on the surface being in a shape approximating to a quadratic curve,

and said reflector is a transflective reflector having the characteristics of having a substantially equal transmittance for light components at respective wavelengths in the wavelength range of visible light.

31. A liquid crystal display device according to claim 17, wherein the white diffusing film is a white diffusing film with a plurality of projections and depressions formed on the surface thereof, causing a portion of light incident on the surface to undergo diffuse reflection and remaining portions of the light to be transmitted therethrough, said projections and depressions formed on the

surface being in a shape approximating to a quadratic curve.

32. (amended) A liquid crystal display device comprising: a first substrate made of a transparent material, provided with signal electrodes or display electrodes formed on one face thereof; a second substrate made of a transparent material, provided with opposed electrodes formed thereon; and liquid crystal sealed in-between the first substrate and the second substrate, oppositely disposed to each other with a predetermined gap interposed therebetween such that each of the signal electrodes or the display electrodes faces each of the opposed electrodes so as to form a pixel, characterized in that

a white diffusing film and a reflector are disposed in that order from the first substrate side on the second substrate;

said white diffusing film having the characteristics of allowing circularly polarized light to pass therethrough substantially as the circularly polarized light, and having a substantially equal transmittance for light components at respective wavelengths in the wavelength range of visible light, provided regions corresponding to respective pixels, having diffusibility differing from that for regions thereof, around the respective pixels.

33. (amended) A liquid crystal display device comprising: a first substrate made of a transparent material, provided with signal electrodes or display electrodes formed on one face thereof; a second substrate made of a transparent material, provided with opposed electrodes formed thereon; and liquid crystal sealed in-between the first substrate and the second substrate, oppositely disposed to each other with a predetermined gap interposed therebetween such that each of the signal electrodes or the display electrodes faces each of the opposed electrodes so as to form a pixel, characterized in that

a white diffusing film and a reflector are disposed in that order from the

first substrate side on the second substrate;

said white diffusing film has the characteristics of allowing circularly polarized light to pass therethrough substantially as the circularly polarized light, and having a substantially equal transmittance for light components at respective wavelengths in the wavelength range of visible light, provided regions corresponding to respective pixels, having a transmittance differing from that for regions thereof, around the respective pixels.

34. A liquid crystal display device comprising: a first substrate made of a transparent material, provided with signal electrodes or display electrodes formed on one face thereof; a second substrate made of a transparent material, provided with opposed electrodes formed thereon; and liquid crystal sealed in-between the first substrate and the second substrate, oppositely disposed to each other with a predetermined gap interposed therebetween such that each of the signal electrodes or the display electrodes faces each of the opposed electrodes so as to form a pixel, characterized in that

a white diffusing film and a reflector are disposed in that order from the first substrate side on second substrate,

said white diffusing film allowing circularly polarized light to pass therethrough substantially as the circularly polarized light, and said pixels being provided with color filters.

35. (cancelled)

36. A liquid crystal display device according to claim 6, wherein an auxiliary light source is provided on a side of the second substrate, opposite the visible side.

37. (cancelled)

38. A liquid crystal display device according to claim 17, wherein an

auxiliary light source is provided on a side of the second substrate, opposite the visible side.

39. A liquid crystal display device according to claim 34, wherein an auxiliary light source is provided on a side of the second substrate, opposite the visible side.

40. (amended) A liquid crystal display device according to claim 6, wherein the white diffusing film is made up of a diffusing-type liquid crystal layer for diffusing light.

41. (cancelled)

42. A liquid crystal display device according to claim 17, wherein the white diffusing film is made up of a diffusing-type liquid crystal layer for diffusing light.

43. A liquid crystal display device according to claim 34, wherein the white diffusing film is made up of a diffusing-type liquid crystal layer for diffusing light.

44. (amended) A liquid crystal display device according to claim 6, wherein the white diffusing film comprises two transparent substrates, provided with an electrode formed on the inner faces thereof, facing each other, respectively, and a mixed liquid crystal layer comprised of transparent solids and liquid crystal, that is sandwiched between the two transparent substrates, a degree of light scattering caused by said mixed liquid crystal layer being rendered variable according to voltage by applying a voltage between the respective electrodes.

45. (cancelled)

46. A liquid crystal display device according to claim 17, wherein the white diffusing film comprises two transparent substrates, provided with an

electrode formed on the inner faces thereof, facing each other, respectively, and a mixed liquid crystal layer comprised of transparent solids and liquid crystal, that is sandwiched between the two transparent substrates, a degree of light scattering caused by said mixed liquid crystal layer being rendered variable
5 according to voltage by applying a voltage between the respective electrodes.

47. A liquid crystal display device according to claim 34, wherein the white diffusing film comprises two transparent substrates, provided with an electrode formed on the inner faces thereof, facing each other, respectively, and a mixed liquid crystal layer comprised of transparent solids and liquid crystal, that is sandwiched between the two transparent substrates, a degree of light
10 scattering caused by said mixed liquid crystal layer being rendered variable according to voltage by applying a voltage between the respective electrodes.

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